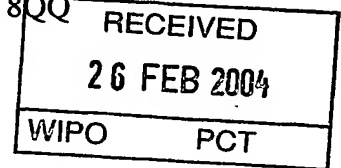




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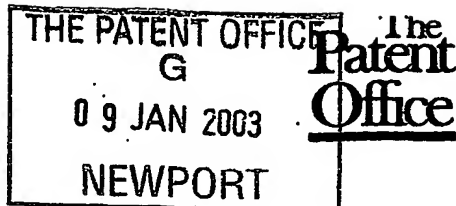
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Dated

*R. Mahoney*  
 9 February 2004

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1. Your reference KP/8340

2. Patent application number  
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0300451.2

9 JAN 2003

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Philip Raymond Hankin

79 Derwent Drive, Priorslee, Telford.  
TF2 9QR.

Patents ADP number (if you know it)

8539603001

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

Exerciser

5. Name of your agent (if you have one)

Swindell & Pearson

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

48 Friar Gate,  
Derby DE1 1GY

Patents ADP number (if you know it)

00001578001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number  
(if you know it)

Date of filing  
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7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

No

a) any applicant named in part 3 is not an inventor, or

b) there is an inventor who is not named as an applicant, or

c) any named applicant is a corporate body.

See note (d))

# Patents Form 1/77

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Continuation sheets of this form

Description 8

Claim(s)

Abstract

Drawing(s)

3 + 3 

10. If you are also filing any of the following, state how many against each item.

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Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature

  
Swindell & Pearson

Date 08/01/2003

12. Name and daytime telephone number of person to contact in the United Kingdom

Kevin Parnham Tel: 01332 367051

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### Exerciser

5           The present invention relates to exercisers and more particularly, but not exclusively, to exercisers used for physiotherapy and circulatory exercise by bedridden and after-care patients.

10           After certain orthopaedic surgery, it is necessary to progressively rebuild confidence, strength and mobility in the affected body part. For example, with knee surgery it is necessary to stimulate progressive bending of a patient's knee without over straining that knee. It will also be understood that such exercise will generally occur at least initially whilst the patient is still bedridden.

15           Previously, a so-called "rehab" board has been used for the above exercise. This "rehab" board essentially comprises a flat wooden board or panel placed upon the patient's bed and a doughnut or ring bandage is then formed within which a patient's heel is placed in order that the leg can be bent by sliding the doughnut to and fro along the board to gradually increase flexibility and  
20           strength. Clearly, carrying a hefty wooden board and forming a ring or doughnut bandage for each patient is cumbersome and time consuming.

          In addition to exercises with respect to knee and hip replacement, it will also be understood that various patients with respect to recovery from other limb  
25           surgery, strokes, forms of orthopaedic surgery and fractures also require at least initially gentle exercise in order to initiate a recovery process.

          In accordance with the present invention there is provided an exerciser for physiotherapy, the exerciser comprising a skid with a slide surface upon one side  
30           and a grip upon the other side whereby a user can perform oscillatory motions by resting a limb upon the grip.

Preferably, the slide surface is flat. Alternatively, the slide surface is curved. Furthermore, the slide surface may be curved in a side to side or front to back or both directions.

- 5           Typically, the skid is a unitary moulding. Alternatively, the skid may be stamped or machined to provide an appropriate shape.

Generally, that moulding is formed from a plastics or metal material. Normally, the skid would be rendered suitable for heat sterilisation.

10

The skid may include an insert to provide the grip. Possibly, the insert is disposable. Advantageously, the insert can be specifically shaped for a user's requirements in terms of the limb used or exercise required. A number of different insert shapes may be secured to or moulded into the skid in order to provide the present exerciser. Alternatively, the skid may be a dimpled or cross-hatched or have ribbed surface to provide the grip.

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The skid may have a generally round, oblong, polygon or rectangular shape.

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The grip may be provided by a non-slip elastomeric material. Typically, that elastomeric material may be a rubber including a silicone rubber.

Preferably, the skid has an upturned curved rim away from the slide surface to prevent snagging of the exerciser during use.

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Advantageously, the upturned rim provides a dished configuration for the skid which cooperates with the grip in use.

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Possibly, the skid incorporates a cushioning material between the grip and the slide surface.

Possibly, the slide surface includes guide ribs or keels to facilitate a preferred direction of slide for the exerciser.

Embodiments of the present invention will now be described by way of example only with reference to the accompanying drawings in which:

5        Fig. 1 is a schematic illustration of an exerciser in use in accordance with the present invention;

      Fig. 2 is a schematic cross-section of a first embodiment of an exerciser in accordance with the present invention.

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      Fig. 3 is a schematic plan view of the exerciser depicted in Fig. 2;

      Fig. 4 is a bottom view of a first exerciser refinement;

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      Fig. 5 is a side view of the exerciser depicted in Fig. 4;

      Fig. 6 is a schematic plan view of a second embodiment of an exerciser in accordance with the present invention;

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      Fig. 7 is a schematic bottom view of a second exerciser refinement;

      Fig. 8 is a schematic front view of the exerciser depicted in Fig. 5; and,

      Fig. 9 is a side view of an exerciser in use..

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30        Fig. 1 is a schematic illustration of an example of use of an exerciser 1 in accordance with the present invention. Thus, a user 2 in this case places their heel 3 upon the exerciser 1 in order to bend and flex their knee 4 by slide motions in the direction of arrow heads A. The exerciser 1 and for that matter the user 2 will generally be lying upon a bed 5. In these circumstances, the user 2 can exercise their knee 4 by using the exerciser 1 without leaving their bed 5. The user 2 is thus able to improve flexibility with regard to the knee 4 as well as strength progressively in accordance with their own conditions and capabilities.

Fig. 1 illustrates the exerciser 1 in accordance with the present invention for use principally with regard to exercising a knee 4. However, it will be understood that there are a number of situations where gentle oscillatory motion is required in order to progressively improve flexibility and strength within a patient or user. For example, an exerciser is required after heel, hip and shoulder surgery. Patients who have suffered a stroke may gradually improve their nervous reflex response by oscillating an exerciser upon a table with forward and rearward motions and/or side to side motions in order to regain both flexibility and strength as well as confidence in their ability to achieve such movements in a controlled fashion.

Figs. 2 and 3 illustrate in more particular detail a first embodiment of an exerciser 21 in accordance with the present invention. Thus, the exerciser 21 essentially comprises a skid 22 upon which a grip 23 may be located or a grip integrally formed with the skid. The skid 22 has a bottom slide surface 24 which is chosen to allow the exerciser 21 to slide upon all expected surfaces for which the exerciser 21 will be used. As indicated previously, the exerciser 21 will normally be used upon a bed surface so that the edges or rim 25 are curved upwardly to prevent snagging with bed sheets etc.

The grip 23 is typically raised above the skid 22 and normally incorporates a depression 26 to accommodate a user's heel or elbow or simply to act as an appropriate rest for a user's limb. The grip 23 may be made from a suitably tactile material to provide grip. Such tactile materials include elastomeric rubbers perhaps presented in a mesh format to provide non-slip properties in engagement with the user's heel, elbow or limb. Generally, the grip 23 will be shaped for the expected limb abutment in order to appropriately engage that limb for grip in the sliding oscillatory motion of the present exerciser 21.

Alternatively, a skid may be provided which is an integral unit with the grip formed with the skid during a moulding or stamping or machining fabrication process. The grip, in such circumstances, will still include a depression but this depression has ribs or a cross-hatched surface to provide a non-slip nature for engagement with the user. Thus, as shown in Fig. 2 by broken line 123 a single

moulding could be provided with ribs or hatches 124 (broken line) providing a non-slip surface.

In Fig. 2 and 3 the exerciser 21 is substantially round and in the shape of a saucer. This shape again resists snagging with bed sheets and mattress surfaces. However, it will be understood that other shapes including oblong, rectangular and polygons could be used provided any corners are appropriately chamfered, smoothed or otherwise shaped to resist snagging.

As illustrated in Figs. 2 and 3 the grip 23 and where used the non-slip layer 27 may be wholly confined within the hollow created by the skid 22. In such circumstances, the grip 23 may be secured to the skid 22 through an adhesive or other mechanism such as a hook and fleece/Velcro fastening. Alternatively, the grip 23 may be sized such that it is in a compression fit within the hollow of the skid 22.

Hygiene is of particular importance with regard to exercising. Thus, the present exerciser 21 can be designed as a unitary moulding such that all of the components, that is to say skid 22 and grip 23 can be sterilised by appropriate heating to an elevated temperature and/or washing in a sterilising solution. For example, the skid 22 may be made from a heat resistant plastic material such as melamine or a metal. An alternative approach to achieving hygienic use is to provide that the grip 23 and where used the non-slip layer 27 are an insert placed within the hollow of the skid 22 as required. In such circumstances, the grip 23 would be removed after each exercise session and a new grip 23 provided for the next patient or next exercise session. These inserts may be disposable or cleanable/sterilisable themselves.

It will be understood that generally, being of a robust nature the skid 22 can be formed from a range of materials which are more readily sterilisable than the grip 23 and so provision of an insert may avoid unacceptable material compromises in order to enable a unitary moulding to be provided which can be wholly sterilised. It will also be understood that a range of grip 23 inserts for



differing patient requirements in terms of heel, elbow or limb size as well as exercise required could be provided whilst using the same skid 22.

Normally, as indicated above, the present exerciser 21 will be used during a rehabilitation phase of physiotherapy and in particular with regard to initial exercising to generate sufficient flexibility and strength prior to more strenuous out of bed exercising. In such circumstances, the slide surface 24 will be generally flat in order to achieve lateral stability for the exerciser 21 in use. However, where an exerciser in accordance with the present invention is used upon a more rigid surface than a bed it is possible if required to provide a slide surface 24 which is shaped to provide some pitch and yore in the oscillatory motion. Clearly, the shaping will generally be by provision of a slight curvature to the sliding surface 24. This curvature may be a simple front to back curve or a side to side curve or a combination in which the slide surface is then substantially domed. This configuration of the slide surface may be of particular benefit with regard to patients with stroke rehabilitation exercising in that progressively more convexed slide surfaces may be provided which will therefore be more liable to topple and therefore providing a challenge to a patient when conducting the oscillatory motions to achieve such motions without toppling either forwards or backwards or side to side. In order to provide an indication of such topple as depicted in Figs. 4 and 5 the normal slide facility of a slide surface 34 may be inhibited by application of a friction surface 33 adjacent to a rim 35 such that if there is topple that friction surface 33 will engage and so resist further slide motion of an exerciser 31.

Fig. 6 illustrates as a plan view a second embodiment of an exerciser 41 in accordance with the present invention. Thus, the exerciser 41 again comprises a skid 42 upon which a rim 45 is provided of an upturned curve nature to prevent snagging. A grip 43 is also provided upon a cushioning layer 47. The combination of grip 43 and cushioning layer 47 is secured within a dish or hollow created by the skid 42 within the rim 45. The grip 43 at least is presented above and proud of the rim 45 such that a user's limb, in this case a forearm or hand can be located upon the grip 43 to enable oscillatory motion in a forward and rearward direction, generally indicated by arrow heads B. The exerciser 41 is

generally rectangular in shape and is designed for that oscillatory motion in the direction of arrow heads B, but it will be understood if desired there may be slide motion laterally of that direction either pivotally about one end of the exerciser 41 or as a planar motion.

5

In use, the exerciser 41 will have a user's arm or foot or hand as indicated previously resting and abutting upon the grip 43. In such circumstances, it will be appreciated that, there is a relatively high user skin surface to grip 43 contact area. Specific shaping in the form of dishing to the grip 43 is not required to achieve adequate association between the user and the grip 43 and therefore the exerciser 41 to create the desired oscillatory motion in the direction of arrow heads B. The exerciser 41 will generally be used upon a hard surface such as a floor or table top where simple oscillatory motions in the direction of arrow heads B are required to initiate therapeutic treatment by stimulating some movement in order to gain flexibility, strength and mechanical control of a user's limb.

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Generally, as indicated with regard to the previous Figs. the slide surface of an exerciser in accordance with the present invention will be flat or at least smoothly curved but this will also render the exerciser equally slideable in all directions. In some circumstances, it may be desirable to provide a preferential slide direction. One means of achieving such preferential slide direction is by providing guide ribs or keels which extend in the desired direction. Figs. 7 and 8 illustrate such guide ribs or keels 52 upon an exerciser 51. Essentially, the guide ribs 52 present little resistance to oscillatory motion in the direction of arrow heads C whilst resisting lateral or side ways motion to that direction. The use of such guide ribs 52 will be particularly beneficial where a relatively soft surface such as a bed mattress is used as these guide ribs 52 can engage that soft surface in order to provide preferential motion. Achievement of such preferential direction for the oscillatory motion in accordance with the present invention may be particularly beneficial with regard to exercising of joints such as the knee where initially unilateral motion in a straight line is preferred in order not to over strain the newly replaced or treated knee.

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Fig. 9 provides a side view of an exerciser 91 in accordance with the present invention. The exerciser 91 comprises a skid 92 within which a grip 93 is located. The grip 93 incorporates a depression 94 within which a user's foot 95 is located in a non-slip engagement. Thus, the whole exerciser 91 oscillates in the direction of arrow heads 96 in order to provide the desired exercise. The exerciser 91 oscillates in the direction of arrowheads 96 upon a surface 97 which in view of the desired foot exercise will typically be a floor or similar surface 97.

As indicated previously, an exerciser in accordance with the present invention can be used for a number of user limbs and joints including arms, elbows, and leg movements without necessity of providing a heavy slide board and provision of a specific ring or doughnut bandage for each patient or user. In such circumstances, the present exerciser provides a more convenient means of achieving initial exercise after surgery or in other situations where gradual recovery of mobility is required.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

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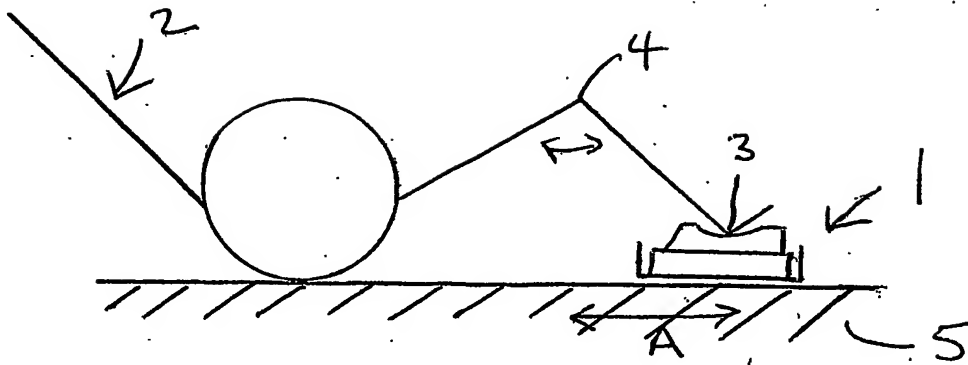


Figure 1

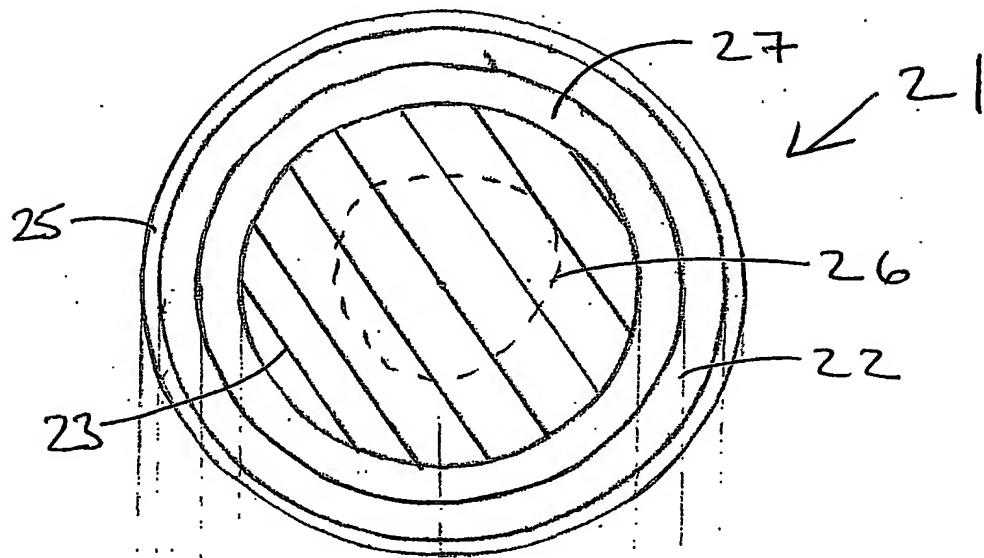


Figure 3

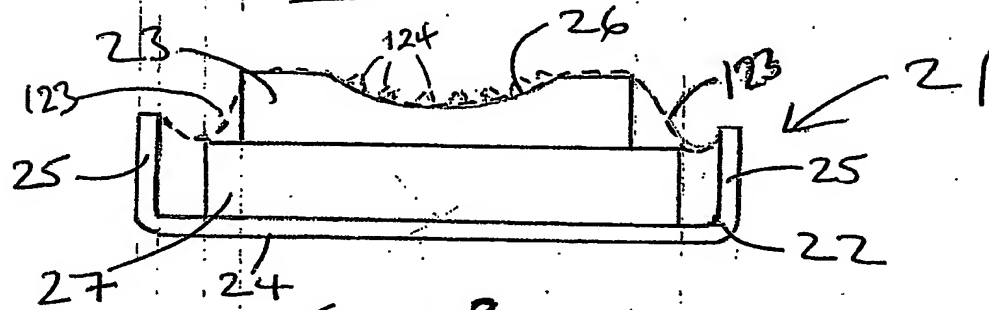


Figure 2

2/3

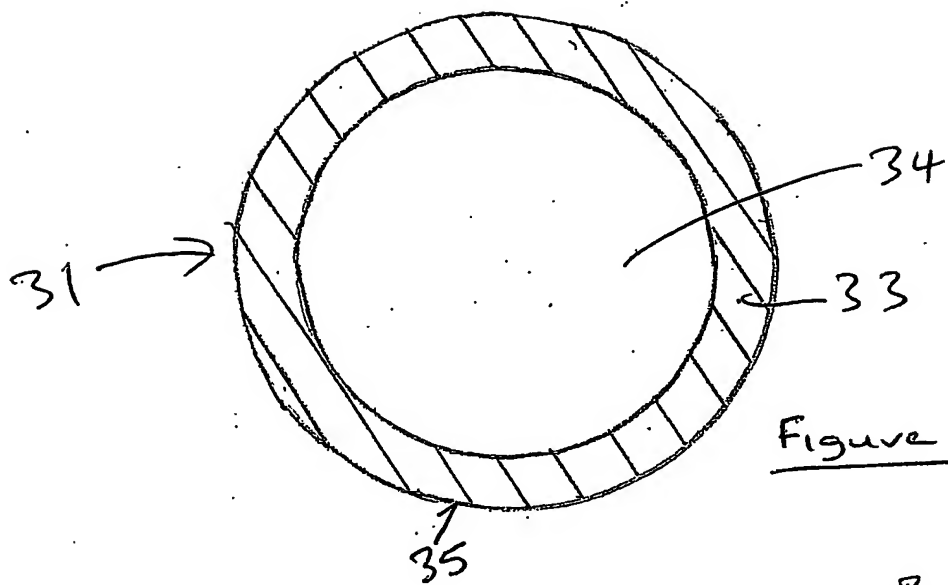


Figure 4

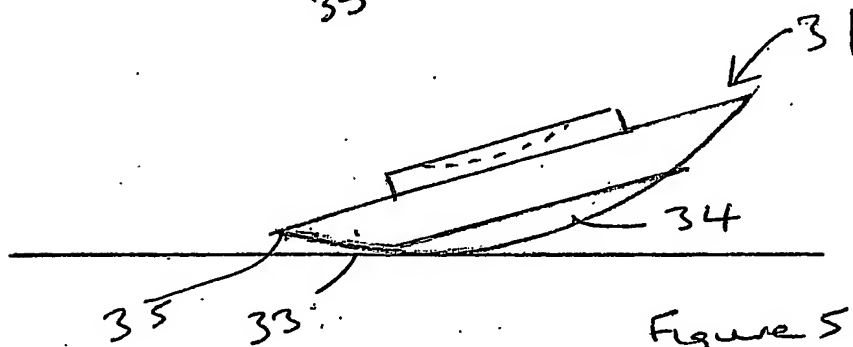


Figure 5

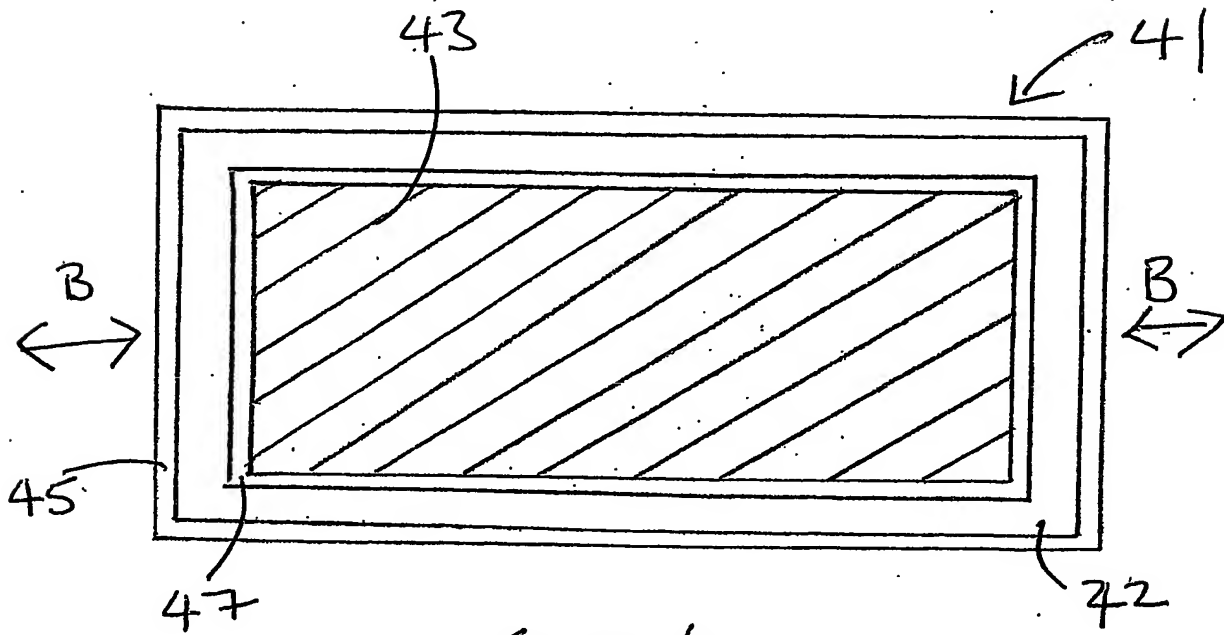


Figure 6

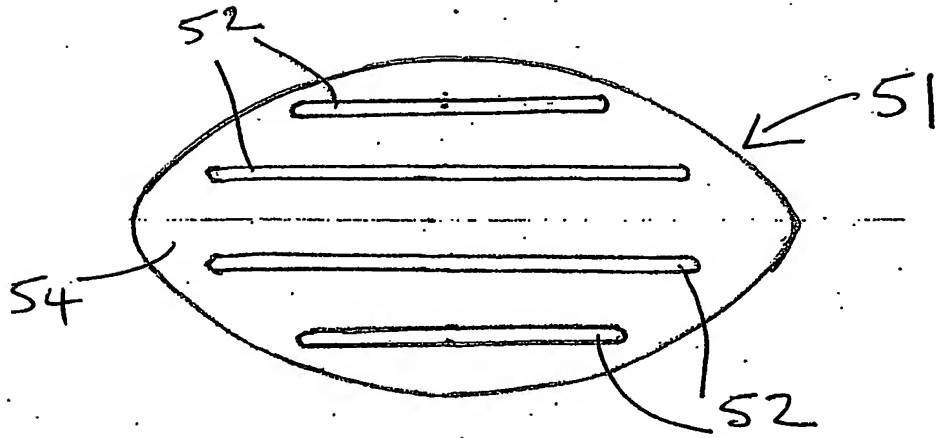


Figure 7

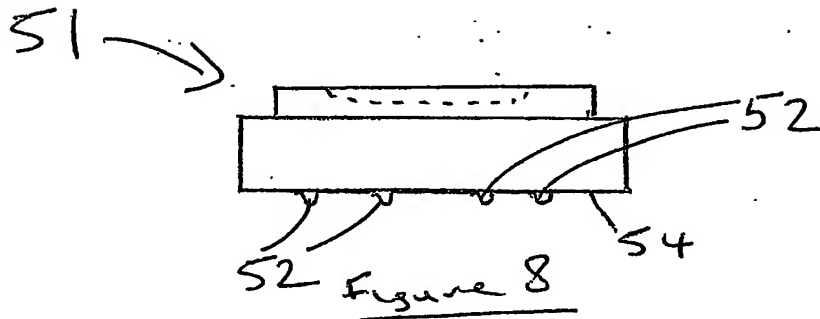


Figure 8

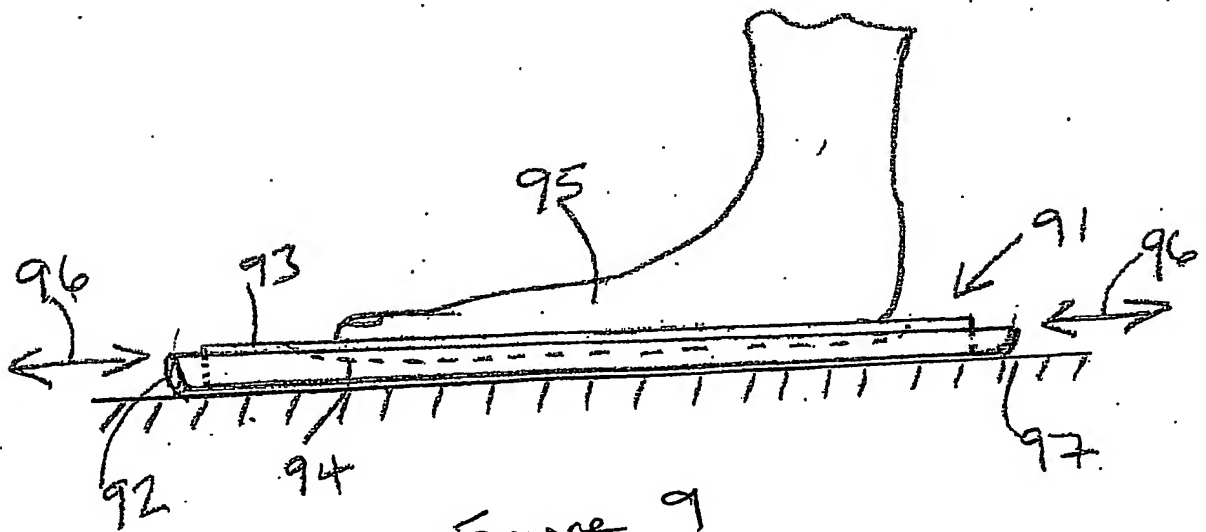


Figure 9

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